

## Original Research Article

# Dermatological changes in pregnancy in central India: a cross sectional study

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## ABSTRACT

**Background:** Pregnancy is a period of profound endocrine and metabolic alterations which make the pregnant woman susceptible to changes in the skin and its appendages. These changes in pregnancy can be either physiological, development of pregnancy specific dermatoses or changes in pre-existing skin diseases. The aim of the study to study the dermatological manifestations of pregnancy.

**Methods:** This was a cross sectional study design. All pregnant females with cutaneous manifestations attending outpatient department of Dermato-Venereo-Leprology and Obstetrics and Gynaecology were recruited during December 2015 to October 2017. They were subjected to general, local and systemic examination. Statistical analysis was done with the help percentage, mean and standard deviation.

**Results:** Out of 400 patients, 216 (54%) were primigravidae and 184 (46%) were multigravidae. Majority of the patients (55%) were in the age group of 21-25 years. Physiological changes were present in all patients and specific dermatoses in 8.75% of patients. The commonest mucosal change was Jacquemier-Chadwick Sign (96.5%) followed by gingivitis (2.5%). Most common pigmentary change recorded was linea nigra. Most common specific dermatoses reported was prurigo of pregnancy (8%) followed by pruritic urticarial papules and plaques of pregnancy (0.5%). Prurigo of pregnancy was more frequently recorded in multigravida patients and more frequently in third trimester of pregnancy. The commonest dermatosis not specific to pregnancy observed was dermatophyte infection.

**Conclusions:** Awareness about various cutaneous changes in pregnancy is important for correct diagnosis that will direct the most appropriate laboratory evaluation and careful management in an effort to minimize maternal and fetal morbidity.

**Keywords:** Skin changes in pregnancy, Specific dermatoses, Prurigo of pregnancy

## INTRODUCTION

Physiological skin changes in pregnancy are benign and reversible. They range from pigmentary skin changes like linea nigra to connective tissue changes like stria gravidarum.<sup>1</sup> Pregnancy specific dermatoses include an ill-defined heterogeneous group of pruritic skin eruptions which are seen only in pregnancy. The first classification

of dermatoses of pregnancy was proposed by Holmes and Black in 1983 and classified them into four skin conditions: pemphigoid gestationis (PG), polymorphic eruption of pregnancy (PEP), prurigo of pregnancy (PP) and pruritic folliculitis of pregnancy (PF).<sup>2</sup> Recently Ambros-Rudolph et al classified pregnancy specific dermatosis into atopic eruption of pregnancy, polymorphic eruption of pregnancy, pemphigoid

gestationis and intrahepatic cholestasis of pregnancy.<sup>3</sup> Among these dermatoses etiopathogenesis of only PG is well established, which has been linked to the presence of HLA-DR3 and HLA-DR4 and has a rare association with molar pregnancies and choriocarcinoma.<sup>4</sup> Pregnancy can also alter the course of certain infections like candidiasis, herpes viral infections; immunological diseases like SLE, systemic sclerosis; metabolic diseases like, porphyria cutanea tarda; connective tissue disorders like Ehlers-Danlos syndrome, pseudoxanthoma elasticum etc.<sup>2</sup> The concerns of the patient having any of the above disorders may range from a mere cosmetic alteration, to the chance of recurrence of the particular problem during a subsequent pregnancy, to the potential effect these changes may have on the fetus in terms of morbidity and mortality. Correct diagnosis is important for the choice of treatment and for the prognosis of mother and child, because certain dermatoses like intrahepatic cholestasis of pregnancy constitute a risk to fetal life.

## METHODS

This cross sectional study was conducted in outpatient department of Dermato-Venereo-Leprology and Obstetrics and Gynaecology at Government Medical College and Hospital, Nagpur during December 2015 to October 2017. After obtaining Institutional Ethical Committee Clearance, all pregnant females with cutaneous manifestations irrespective of gravidity and trimester were recruited in pre-designed proforma. All pregnant females not willing for consent were excluded from our study. All patients were subjected to general, cutaneous and systemic examination. The spectrum of cutaneous manifestations in pregnancy was divided into three categories- Physiological skin changes, specific dermatoses of pregnancy and dermatoses not specific to pregnancy (coincident dermatological disorders in pregnancy) Relevant hematological and biochemical investigations were done whenever necessary. Quantitative data is presented with the help of percentage, mean and standard deviation.

## RESULTS

Four hundred pregnant patients with cutaneous manifestations were enrolled, amongst them 216 (54%) were primigravida and 184 (46%) were multigravida, as depicted in Figure 1. Majority of the patients (55%) were in the age group of 21-25 years, followed by 20% in the age group of 26-30 years as depicted in Table 1. Most of the patients belonged to third trimester 252 (63%), while 120 (30%) and 28 (7%) patients were in second and first trimester of pregnancy respectively as depicted in Figure 2.

Physiological skin changes were observed in all patients (100%) while specific dermatoses of pregnancy in 35 patients (8.75%) and dermatoses not specific to pregnancy in 147 patients (36.75%), as depicted in Table 2.

**Table 1: Distribution of patients according to age.**

Age (yrs)	N	%
<b>18-20</b>	60	15
<b>21-25</b>	220	55
<b>26-30</b>	80	20
<b>31-35</b>	40	10
<b>Total</b>	400	100

**Table 2: Spectrum of cutaneous manifestations in pregnancy.**

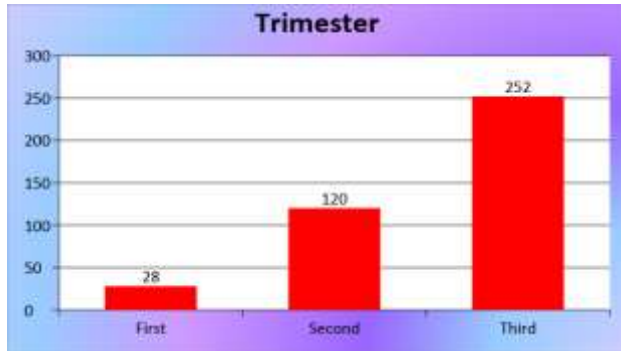
Spectrum of cutaneous manifestations in pregnancy	No. of patients N (%)
<b>1. Physiological changes</b>	400 (100)
<b>2. Specific dermatoses of pregnancy</b>	35 (8.75)
<b>3. Dermatoses not specific to pregnancy</b>	147 (36.75)

**Table 3: Distribution of physiological changes.**

Physiological changes	No. of patients	%
<b>Pigmentary changes</b>		
1) Linea nigra	347	86.8
2) Areolar hyperpigmentation	273	68.2
3) Melasma	118	29.5
4) Pigmentary demarcation lines	8	2
<b>Connective tissue changes</b>		
Striae gravidarum	301	75.2
<b>Glandular changes</b>		
1) Montgomery tubercles	139	34.8
2) Miliaria	15	3.8
<b>Vascular changes</b>		
1) Edema of feet	41	10.2
2) Palmar erythema	28	7
3) Varicosities of legs	2	0.5
4) Spider angiomas	1	0.2
<b>Mucosal changes</b>		
1) Jacquemier-Chadwick Sign	386	96.5
2) Gingivitis	10	2.5
<b>Nail changes</b>		
1) Brittle nails	3	0.75
2) Transverse grooving	2	0.5
3) Subungual Hyperkeratosis	1	0.2
4) Pitting	1	0.2
5) Distal onycholysis	1	0.2

Amongst physiological changes mucosal changes were most common, followed by pigmentary changes, connective tissue changes, glandular changes, vascular and nail changes, as depicted in Table 3. Most common mucosal change observed was Jacquemier-Chadwick Sign (386, 96.5%) followed by gingivitis (10, 2.5%). Linea nigra was most commonly observed pigmentary

change followed by areolar hyperpigmentation (273, 68.2%), melasma (118, 29.5%) and pigmentary demarcation lines (PDL). Striae gravidarum was recorded in 301 patients (75.2%). Most frequent glandular change was montgomery tubercles (139, 34.8%). Among vascular changes edema feet was most common (41, 10.2%), followed by palmar erythema (28, 7%), varicosities of leg and spider angiomas. Nail changes were least commonly reported.



**Figure 1: Distribution of total patients according to parity.**

**Table 4: Specific dermatosis in pregnancy.**

Specific Dermatoses	N	%
Prurigo of pregnancy	32	8
Pruritic urticarial papules and plaques of pregnancy	2	0.5
Pemphigoid gestationis	1	0.2
Intrahepatic cholestasis of pregnancy	0	-

**Table 5: Specific dermatoses of pregnancy (gravidawise distribution).**

Specific dermatoses	Primi		Multi	
	N	%	N	%
Prurigo of pregnancy	8	2	24	6
Pruritic urticarial papules and plaques of pregnancy	1	0.25	1	0.25
Pemphigoid gestationis	1	0.25	0	-
Intrahepatic cholestasis of pregnancy	0	-	0	-

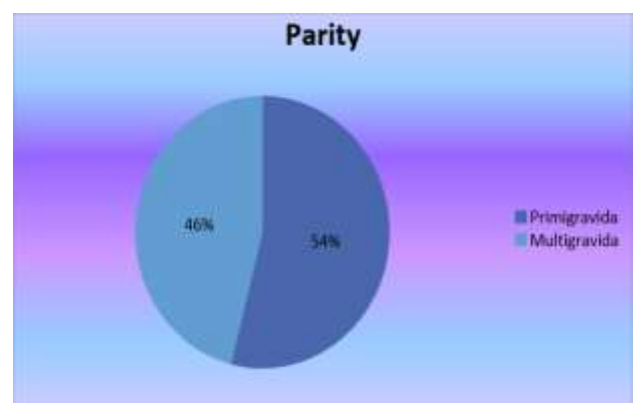
**Table 6: Specific dermatoses of pregnancy (trimesterwise distribution).**

	First	Second	Third
	N (%)	N (%)	N (%)
Prurigo of pregnancy	0	8 (2)	24 (6)
Pruritic urticarial papules and plaques of pregnancy	0	0	2 (0.5)
Pemphigoid gestationis	0	1	0
Intrahepatic cholestasis of pregnancy	0	0	0

**Table 7: Dermatoses not specific to pregnancy.**

Dermatoses	N	%
<b>Infections and infestations</b>		
Dermatophytosis	64	16
Candidal vaginitis	13	3.2
Scabies	11	2.8
<b>Viral infections</b>		
Varicella	28	7
Molluscum contagiosum	12	3
Herpes labialis	5	1.2
Herpes zoster	2	0.5
Verruca vulgaris	2	0.5
Condyloma accuminata	1	0.25
Hansen's Disease	2	0.5
<b>Psoriasis</b>		
Psoriasis vulgaris	1	0.25
Pustular psoriasis	1	0.25
Acne vulgaris	32	8
<b>Autoimmune diseases</b>		
Systemic lupus erythematosus	1	0.25
Pemphigus vulgaris	1	0.25
Vitiligo	1	0.25
<b>Cutaneous tumors</b>		
Neurofibromatosis	2	0.5

Pregnancy specific dermatoses were observed in 8.7% (n=35) patients. The most common specific dermatoses of pregnancy observed was prurigo of pregnancy seen in 8% (n=32) patients, more frequently in multigravida (n=24) as compared to primigravida (n=8). Two cases of pruritic urticarial papules and plaques of pregnancy were observed one each in multigravida and primigravida. We documented a singular case of pemphigoid gestationis in primigravida, as depicted in Table 4 and 5. Prurigo of pregnancy were more commonly observed in the third trimester of pregnancy as compared to second trimester (6% vs. 2% respectively). Both patients of pruritic urticarial papules and plaques of pregnancy were observed in third trimester. Single case of pemphigoid gestations was observed in the second trimester as depicted in Table 6.



**Figure 2: Distribution according to trimester.**

The most common dermatoses not specific to pregnancy observed was fungal infection followed by viral infections, acne vulgaris and other dermatoses as described in Table 7. Among fungal infection, dermatophytosis (n=64) was most common found in 16% of patients followed by candidial vaginitis (3.2%). Varicella (n =28) was most common viral infection seen in 7% of patients followed by molluscum contagiosum (n=12, 3%). Acne vulgaris was observed in 32 patients. Two cases (0.5%) each of Hansen's disease and psoriasis were observed in our study. Amongst autoimmune diseases one case each of pemphigus vulgaris, vitiligo and systemic lupus erythematosus were observed in our study.

## DISCUSSION

Majority of the patients (55%) were in the age group of 21-25 years followed by 20% in the age group of 26-30 year with a mean age of 24.66 years, which correlated with studies by Kumari et al Hassan et al and Nair et al.<sup>5-7</sup> Kumari et al observed age of patients ranged from 18 to 36 years with the mean age being 23 years.<sup>5</sup> Hassan et al found the mean age to be of 24 years (range: 17-39 years).<sup>6</sup> The age wise distribution was however found to be slightly higher by Nair et al who reported the mean age to be of 27.3 years with (range: 19–42 years).<sup>7</sup>

We observed 216 (54%) patients were primigravidae whereas, 184 (46%) patients were multigravidae, which were in accordance with Kumari et al, Hassan et al and Nair et al.<sup>5-7</sup> Kumari et al, found among 607 women, primigravidae accounted for 303 (49.9%) of the patients whereas 304 (51.1%) were multigravidae.<sup>5</sup> Whereas Hassan et al, found out of a total of 650 women 272 (42%) were primigravidae, while 378 (58%) were multigravidae.<sup>6</sup> The study conducted by Nair et al on factors influencing pregnancy dermatoses, of a total of 175 antenatal women, 95 were primigravidae (54.3%) and the rest 80 (45.7%) were multigravidae.<sup>7</sup>

In our study, 28 (7%) patients belonged to first trimester, while 120 (30%) and 252 (63%) patients were in second and third trimester of pregnancy respectively, as seen in study conducted by Kumari et al.<sup>5</sup>

Physiological skin changes were present in all (100%) of the patients, specific dermatoses of pregnancy were observed in 35 (8.75%) of the patients and dermatoses not specific to pregnancy were documented in 147 (36.75%) patients, which corroborated with studies by Kumari et al, Hassan et al.<sup>5,6</sup> A study conducted by Kumari et al, of 607 pregnant women, physiological skin changes were present in all cases, specific dermatoses of pregnancy were reported in 22 (3.62%) of their cases whereas dermatoses not specific to pregnancy were observed in 125 (20.59%) of their patients.<sup>5</sup> Hassan et al, found all patients had physiological skin changes, specific dermatoses of pregnancy were observed in 32 (4.92%) patients whereas dermatoses not specific to

pregnancy were documented in 48 (7.38%) of their patients.<sup>6</sup>

The most common physiological changes seen in pregnancy were mucosal changes which included Chadwick sign (96.5%) and gingivitis (2.5%). In the study by Kumari et al, Jacquemier–Chadwick sign was reported in 100% of the patients thus corroborating the findings of our study whereas gingivitis was reported in 1.5% of the patients.<sup>5</sup>

Most common pigmentary change was found to be linea nigra observed in 347 (86.8%) of the cases. Melasma was reported in 118 (29.5%) patients. Other pigmentary changes noted in our study were secondary areola in 273 (68.2%) of the cases and pigmentary demarcation lines in 8 (2%) of the patients. In the study by Kumari et al, the commonest pigmentary change reported was linea nigra (91.4%), which corroborates our study findings, followed by areolar hyperpigmentation (78.4%), however the incidence of melasma (2.5%) was much lower than the present study.<sup>5</sup> The possible reason for this discrepancy in prevalence of melasma in our study and other Indian studies on pregnant women could be due to difference in the skin phototypes.

Striae gravidarum was reported in 301 (75.2%) patients. This finding was consistent with those reported by Kumari et al and Rathore et al who reported striae gravidarum in (79.7%) and (64.8%) of their patients respectively.<sup>5,8</sup>

The commonest glandular change observed was montgomery's tubercles in 139 (34.7%) patients followed by miliaria in 15(3.7%) patients. In the study by Kumari et al montgomery's tubercles was recorded in 36.2% of patients and miliaria 1.6% of the patients.<sup>5</sup> Rathore et al found similar results.<sup>8</sup>

The vascular changes recorded in the present study were non pitting edema of feet in 41 (10.2%) cases, followed by palmar erythema 28 (7%), varicosities of legs 2 (0.5%) and spider telangiectasia in 1 (0.25%) patient, these results were in accordance with Rathore et al, and Kumari et al.<sup>5,8</sup>

The prevalence of nail changes in our study were similar to that reported by Rathore et al who reported nail changes in 2.1% of their patients with brittle nails in 0.8%.<sup>8</sup>

In our study pregnancy specific dermatoses were seen in 35 (8.7%) patients. The most common specific dermatoses of pregnancy observed in our study was prurigo of pregnancy seen in 32 (8%) of the cases which is similar to study by Hassan et al, who reported pregnancy specific dermatoses were reported in 32 patients (4.9%).<sup>6</sup> Prurigo of pregnancy was the commonest pregnancy specific dermatoses detected in 16 patients (2.5%).



Prurigo of pregnancy was most commonly reported in multigravide 24 (6%) as compared to primigravide 8 (2%), while there was equal number of case of pruritic urticarial papules and plaques of pregnancy in primigravide and multigravide patients. The singular case of pemphigoid gestationis was observed in a primigravida patient.

Prurigo of pregnancy was more prevalent in the third (6%) as compared to the second (2%) trimester of pregnancy. The two cases of pruritic urticarial papules and plaques of pregnancy were observed in third trimester while the singular case of pemphigoid gestationis was diagnosed in the second trimester.

We reported 13 (3.2%) patients with candidal vaginitis, the results corroborated with the study done by Kumari et al where it was reported in 2.8% of the patients.<sup>5</sup> Eleven cases (2.8%) of scabies infestation were detected which is similar to the findings by Hassan et al who reported scabies infestation in 2% of the patients.<sup>6</sup>

The present study differed from those by Kumari et al, and Hassan et al, as no case of varicella in pregnancy has been reported by them, in contrast to 28 patients (7%) reported by us.<sup>5,6</sup> Majority of the patients in our study belonged to lower socioeconomic strata and live under conditions of overcrowding, this coupled with the harsh winter in this region may be responsible for the high incidence of varicella reported in the present study.

Two patients (0.5%) had psoriasis, the results were similar to that reported by Hassan et al, i.e., (0.5%), whereas Kumari et al, reported a singular case (0.1%) of psoriasis in their study.<sup>5,6</sup> There were 32 patients (8%) with acne vulgaris in the present study, which was similar to that reported by Rathore et al (8.4%).<sup>8</sup>

## CONCLUSION

Skin changes are quite common in pregnancy though most of them are physiological in nature and need no further management. However, the specific dermatoses of pregnancy, which are not a rare entity, can be a source of significant distress to the pregnant female and need

timely therapeutic intervention. Clinicians need to distinguish between physiological skin changes and specific dermatoses of pregnancy for better patient care.

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